The Virginia Department of Environmental Quality (DEQ) released a revised water quality monitoring strategy on August 9, 2004 for public comment. DEQ is particularly interested in seeking comment on the 2004-2014 implementation plan, found in Chapter IX. The implementation plan contains milestones for all water quality monitoring programs at DEQ. For that reason, DEQ has provided this copy of Chapter IX on its webpage. Due to the size of the entire Strategy document (over 50mb with attachments), it is not practical to distribute on the web. If you would like a copy of the entire draft revised water quality monitoring strategy on CD-ROM, a link can be found on the http://www.deq.virginia.gov/watermonitoring/monstrat.html webpage to order the draft strategy.

To make viewing this document easier, the linked documents referenced by the blue text have been appended below the text of the chapter.

IX. Plan and Schedule for Implementation

Each of the monitoring programs discussed above, in the body of this Strategy, contains a separate section that describes the plan and schedule for the continual development and/or implementation of that module. The plans and schedules were originally presented in this manner because of their varying stages of development. For the most part, each module of the WQM Program has already been implemented. However, the need for continual reevaluations and adaptations to new needs and changing resource availability suggests that a "fully implemented" WQM Strategy will always remain a vision for the future.

The following sections present an historical overview of the evolution and implementation of the WQM Strategy and a summary of its future vision.

A. Historical Perspective:

DEQ formed a Water Quality Monitoring Task Force workgroup in the spring of 1997, in response to the Water Quality Monitoring, Information, and Restoration Act (WQMIRA - Article 4.01 of the Code of Virginia). The results and progress of that task force, from its inception until the initial draft monitoring strategy was delivered to EPA, are documented in the table "Chronology of WQM Task Force and Strategy Evolution" (IX-1.xls). In most cases the task force established the target dates for its accomplishments, but in several instances legislation or other factors outside of the task force dictated timelines. The 'accomplished date' documents when the task was actually completed. Tasks consisted of meetings, subcommittee progress reports, finished documents delivered, or other activities. The Responsible Person(s) is the individual or group that was responsible for completing the task and the number listed in the MIRA column is the corresponding Section (§B.) of WQMIRA that the task addresses.

Several monitoring initiatives described in the original WQM Strategy draft were implemented contemporarily with the development, revision and initial implementation of the strategy itself. Estuarine probabilistic monitoring was initiated in the summer of 2000, with a federal grant under the auspices of the Coastal 2000 / National Coastal Assessment Program. Probabilistic monitoring in free-running freshwater streams was initiated with internal agency resources in the fall (Oct-Nov) of 2001, soon after the Watershed Monitoring Network was defined and established; the first two-year rotation of watershed monitoring sites was initiated on July 1, 2001.

B. Recent and Current Considerations:

Recently declining economic trends and the consequent reduction of state and federal resources available for water quality monitoring have resulted in several modifications to DEQ's Water Quality Monitoring Program. Discussions and deliberation among WQM staff and upper-level DEQ administrators during 2002 and 2003 resulted in the drafting and subsequent publication of a guidance document for managing WQM programs while under reduced resources (Guidance Memo No. 03-2004 – 10 February 2003) [III-A-0f.pdf]. This memo formally established priorities, relative to resource redistribution and program continuity, for the various monitoring programs and subprograms within the overall WQM Strategy. The agency recognized there was little discretion allowed to reduce resources dedicated to Priority Group1 monitoring activities because of the need to: (1) Minimize environmental damage from pollution incidents; (2) Provide key agency programs with needed data in a timely fashion; (3) Meet commitments made by the Commonwealth; and/or, (4) Ensure consistency and usefulness for statewide application of data. Every effort should be taken to fully implement the monitoring plans for these activities, including the possible reduction in monitoring resources for activities listed in Priority Group 2. Priority Group 2 monitoring activities are considered important in providing a broad-based, comprehensive monitoring program for the Commonwealth. The goal is to conduct as much monitoring

in these activities as resources allow, in order to achieve the objectives in the Monitoring Strategy. However, management discretion exists to reduce resources dedicated to these activities, either at the statewide or regional level, based on budget constraints. Any reduction in resources should be designed to maintain a balanced investment in each of these monitoring activities. No monitoring component should be entirely eliminated in any year without consultation among both central office and regional staff.

C. Future Vision:

The VA-DEQ has its eyes on the future and is aware that newly arising water quality concerns will arise, that currently identified concerns will undoubtedly require increasing resources in the future, and that even an ideally conceived water quality monitoring program will always be limited by resource availability. Wherever possible, we have attempted to anticipate these needs and the increased resources required. The possible effect of future inflation on program costs has not been included in the estimates.

1. Milestones, Timelines and Resource Requirements - 2005-2014

In many cases, the milestones described in the following section correspond to defined objectives already identified for improving implemented programs and subprograms. In some cases, the resources required for meeting these goals or attaining milestones, and the associated timelines, have already been confirmed. In other cases, the milestones identified correspond to the requirements considered necessary to fill perceived gaps in the specific programs or subprograms being discussed. (More detailed discussions of specific components of the WQM Program may be found in Chapter III – Design and Implementation.) Under these conditions, the estimated timelines are themselves often contingent upon acquiring the necessary resources for attaining the identified goals. A generalized summary of goals and milestones is presented in the linked spreadsheet "Implementation Plan and Schedule for of the VA-DEQ Water Quality Monitoring Strategy" [IX-2.xls]. This extensive table includes both historical milestones and future timelines associated with the evolution of the current Water Quality Monitoring Program and DEQ's Water Quality Monitoring Strategy.

One notable challenge is the need for additional human resources. The availability of financial resources to pay salaries does not guarantee the acquisition of permanent FTEs. The Virginia General Assembly has defined personnel 'caps' for permanent employees hired by each state agency. Requests for additional personnel must be reviewed and approved, and the additional positions authorized by the General Assembly prior to seeking and hiring new personnel. The option of contracting temporary personnel or consulting services is generally not viable for long-term monitoring activities.

Resource estimates provided in this section are based on current costs and are not corrected for anticipated inflationary increases over the ten-year timeframe under consideration, nor do they include logistical costs or benefits and indirect costs associated with human resource requirements. (If so desired, a standard benefits coefficient of 30% and 28.5% for indirect costs [rent, support, workers compensation insurance, etc.] may be added to the human resource estimates provided here.) Resource requirements for new equipment and for depreciation/replacement of existing equipment also are not included.

(a) Ambient Monitoring Program

(1) Watershed Monitoring Network

The Watershed Monitoring Network is considered a fully implemented, permanent component of DEQ's Water Quality Monitoring Program. It is considered to be a Priority 2 monitoring activity; its intensity of monitoring can be adjusted (thought not permanently suspended) in response to resource availability. The network was

initiated in 2001, following implementation of the 1st edition of the WQM Strategy. Adjustments may be made to the density of stations in response to changing evaluations of NPS Pollution risk potential and/or resource availability.

As currently executed (FY2005), estimated annual resource expenditures for the Watershed Monitoring Network are approximately $193,772 for analytical costs (at the state laboratory) and seven Salary Band 4 'full-time equivalents' (FTEs) of human resources for fieldwork (approximately $280,000 annually).

2006 – The third 2-year watershed/station rotation will be initiated on 1 July.

2008 – The first full six-year rotation[28] will be completed on 30 June. The second six-year full rotation cycle (2008-2014) will be initiated on 1 July. By July of 2008 DEQ will have reviewed its monitoring of 1st and 2nd (Strahler) order streams and will increase emphasis on monitoring this resource class, if deemed necessary.

(2) Probabilistic Monitoring Networks

Both freshwater and estuarine probabilistic monitoring (ProbMon) are relatively new activities to DEQ, are considered to be 'pilot projects' in their current form, and are still evolving in their designs and methodologies. Probabilistic monitoring, in general, is considered to be a Priority 1 monitoring activity, since it provides information in a form that is not available from other monitoring programs. The representative (completely unbiased) results from the ProbMon programs are capable of providing resource-wide, basin-wide, and statewide characterizations of water quality with a known level of statistical confidence (i.e., known degree of error for the calculated estimates). It is therefore the ideal program for carrying out statewide monitoring for parameters that are extremely expensive to analyze (e.g., trace toxic metal and organic compounds). The results from probabilistic monitoring also provide a basis for evaluating the representativeness or bias of other monitoring designs. Resource availability is a primary concern in the continued development of these ProbMon activities.

Free-Flowing Freshwater Probabilistic Monitoring Program

The freshwater ProbMon Program was initiated in the spring of 2001, and the first five-year demonstration project will be completed in 2005. The agency hopes to continue with at least another five years of sampling, and to eventually make this activity a permanent part of our monitoring strategy. Freshwater ProbMon still has a number of design problems to resolve. The biggest challenge to resolving these problems is identifying or developing appropriate sampling methods and securing the necessary resources to continue the program.

Current annual (FY2005) analytical expenditures for this activity are approximately $94,940. Site acquisition, sample collection, habitat evaluation and data analysis components of this program are especially demanding of human resources. Travel time, physical sample collection and habitat evaluations require an average of 2 FTE-days of field time per site, including at least one biologist (Salary Band 5). The separation and identification of biological samples requires an additional day of laboratory time for a biologist/site. A conservative estimate of annual human resource costs for field and laboratory work totals approximately $40,000. This figure does not include data management, data analysis and reporting requirements!

Data analysis and reporting are currently performed voluntarily, part time, by personnel associated with other programs/activities. To continue the development of this program, especially with expanded parameter coverage

[28] The first full rotation cycle, exceptionally, consists of seven rather than of six years. See the text of Chapter III – Design and Implementation (Watershed Monitoring Network) for a full explanation.

and the resultant data analysis requirements, the addition of a fulltime position for data management, analysis and reporting is a necessity. An additional FTE at Salary Band 5 would require a minimum of $35,000 annually.

This program still has a number of design problems to resolve (refer to Chapter III – Design and Implementation). The biggest challenge to resolving these problems is identifying or developing appropriate sampling methods and securing the necessary resources to continue or to expand the program. For this reason, it is difficult for the agency to establish estimates of cost and timelines for accomplishing all of them at this time. Three specific needs dealing with data collection have been identified: (1) sampling non-wadeable streams, and (2) adding algae community analysis and/or (3) adding fish community analysis to the present benthic community analysis. Sampling in non-wadeable streams is dependent on the development of new techniques for sampling in these waters. To some degree this is also dependent on the development of algae and fish techniques, which may be the best choice. While the solution to this problem is not currently known, it can be assumed that it will require additional resources at the Regional Monitoring level. The agency expects to develop a workable technique within the next 5 years. Only one of these needs (algae communities) is currently being addressed.

2004-2005: Virginia, with the help of an EPA grant ($91,000) to the Philadelphia Academy of Natural Sciences, is currently taking the first steps toward developing algae monitoring techniques. In the fall of 2004 DEQ will collect periphyton samples at all of its probabilistic monitoring sites and will begin the statistical analysis of those data to develop meaningful metrics to assess algae data. Current annual resource requirements for collecting and contracting out the identification of algae and the development of numeric indices are approximately $95,000. If successful, the agency hopes to continue this program in the future, but the continuation of algae sampling and identification is dependent on securing additional financial and human resources. As indicated elsewhere, an additional biologist at each of seven regional offices would facilitate the continued development of this program as well as several others (e.g., normal Biological Monitoring Program, TMDL Support Program, etc.). If the addition of such positions were approved for the seven regional offices, the additional human resource costs would total a minimum of $240,000 annually. As indicated, these resources would contribute significantly to the normal Biological Monitoring and TMDL Support programs as well!

2004 - Fall 2004 sampling is being integrated with EPA's National Probabilistic Assessment efforts. Additional habitat measurements and benthic invertebrate samples are collected, with EPA grant resources, to support the national program.

2005 - Continue with evaluation of results from the first five years: (1) Evaluate relative susceptibility of 1st and 2nd order streams to NPS, (2) Redistribute weightings and/or adapt Watershed Monitoring Network, (3) Redesign, redefine or eliminate (?) freshwater ProbMon program.

Estuarine Probabilistic Monitoring Program

2004 – The original five-year 'Coastal 2000' grant from EPA/ORD expires on 30 September 2004. A one-year no-cost extension has been requested in order to complete summary reports on fish community data that was collected during the first five years of the program. Because the field collection phase will not be completed until September 2004, a one-year extension was required to allow for data analyses, summarization and reporting. A request also has been submitted for the reallocation of carry-over funds for a special study of sampling gear scheduled for the summer of 2004 and for the production of three reports to be completed in 2005.

Summer 2004 – A side-by-side comparison study of benthic IBI results using 'Petite Ponar' and standardized 'Young' grab samplers will be performed by Dr. Dan Dauer of Old Dominion University. The Coastal 2000

grant will contribute ~$15,000 - an additional ~$50,000 will be provided by the Chesapeake Bay Program. (Estimated total cost ~$70,000)

2005 – Three final reports are scheduled for completion by June of 2005:

1. "National Coastal Assessment 5-Year Summary Report on Fish Species Distribution and Abundance" (June 2005) - summary report (Chesapeake Bay and Atlantic coastal), with statistics on species richness, diversity, and evenness. A report for public distribution will include GIS elements, mapping all sampled sites and selected indices of interest across all of the states estuarine waters. The report will be produced by the VIMS Fisheries Science Laboratory at a cost of $12,000.

2. "Development of a Fish Community Assessment Tool (Modified Index of Biotic Integrity) for Virginia's Small to Moderate Sized Tidal Tributaries" (June 2005) – multivariate statistical analyses of fish community data with development of a tentative Fish IBI for Virginia's minor tidal tributaries to Chesapeake Bay and the Atlantic coast. The report will be produced by Dr. Gregory Garman of Virginia Commonwealth University at a cost of $14,000. (The development of this tool does not imply that it will be acceptable as a formal 305(b) assessment methodology for the aquatic life designated use.)

3. "Side-by-Side Comparison of 'Standardized Young Grab' and Composite 'Petite Ponar Grab' Samples for the Calculation of Benthic Indices of Biological Integrity (B-IBI)" (April 2005) – summary report on results and conclusions from the special study described above.

2005-2009 - Continuation of the Estuarine Probabilistic Monitoring Program – Beginning in the summer of 2005, DEQ's Coastal 2000 / National Coastal Assessment Program (total of 50 sites annually) will be partially integrated with the probabilistic elements of the Chesapeake Bay Benthic Monitoring Program (35 sites annually within the Bay drainage). This will provide additional resources to continue the NCA Program in the absence of the federal funding that expires in September 2004. The estimated annual cost for continuing the program, as now envisioned and without considering the costs for agency personnel and replacement of field equipment, is approximately $150,000. This figure does include the hiring of four summer interns for the mid-June through late September field season. DEQ's Chesapeake Bay Program (CBP) and the Ambient Water Quality Monitoring (WQM) Program will contribute approximately equally to this activity. Assuming the continued availability of state resources (CBP and WQM) at the current level, the estuarine ProbMon Program will be continued in this form (~$150,000 annually) through 2009, after which the accumulated results from the second five-year period will direct any required modifications in the program. This level of continued support for the Estuarine Probabilistic Monitoring Program should continue for at least five years (2005-2009). The addition of continued federal support for this program would permit: (1) the analysis of the complete sediment quality triad at all sites (rather than depending upon a tiered screening process), (2) the inclusion of fish community sampling and fish tissue analyses (see below), and/or (3) a possible increase in the number of sites sampled each year. (See text of Chapter III, Design and Implementation, for details.)

The trawl sampling for fish community data and the chemical analyses of fish tissue have represented approximately 40% of the total NCA budget over the past five years, and will have to be suspended without continued federal support. Continuation of this element of the program would require approximately $130,000 annually for contracted (VIMS) trawl sampling and the local (Virginia State Laboratory - DCLS) analysis of a single species of fish from each of 50 sites.

2006 – Pending the availability of NCA data from EPA's nationally contracted laboratories, a five-year (2000-2004) summary report will be produced to characterize Virginia's estuarine waters. Data for locally analyzed (DCLS) water quality parameters are generally available from one to two months after sample collection,

depending upon the specific analyte of interest. Sediment data (benthic taxonomy, toxicity, and chemistry) and fish tissue data analyzed at EPA-contracted laboratories, however, generally take up to two years to pass EPA QA screening and become available to the states. These results, especially from the sediment quality triad, are considered to be an absolute necessity for the complete characterization of estuaries, especially relative to the 'aquatic life designated use'. This timeline may be delayed if the required sediment and fish tissue data are not yet available in 2006. The estimated total cost of this report, including 0.2 FTE (~$8000) for statistical analyses and report preparation, contracted calculation of the appropriate B-IBI (~$6000), and printing (~$1000), would be approximately $15,000.

2007 – Pending results from the 2006 five-year summary report, an evaluation will be made of conditions in Virginia's large Coastal Bays (Chincoteague Bay, Back Bay, etc.). If the bays are considered to be in good condition, probabilistic sampling there may be temporarily suspended and later resumed for another five-year characterization period. The resources would be redirected to sampling and characterizing additional probabilistic sites from other resources within the current sampling frame.

2010 – Following a second five-year cycle of probabilistic estuarine monitoring, another five-year characterization report will be produced (~$15,000). (Rapid turnaround times from locally analyzed samples will permit the production of this report within one year after the sampling period ends!) The results of this report, and the availability of resources at that time, will determine the direction of the program for the third five-year cycle (2010 –2014).

(3) Trend Monitoring Network

The Trend Monitoring Network is considered a fully implemented, permanent Priority Group 1 component of DEQ's Water Quality Monitoring Program. It is currently being complemented (beginning in October 2004) by the newly established "Non-Tidal Trend Monitoring Network" (NTMN) of the agency's Chesapeake Bay Program. Trend monitoring is considered to be a Group 1 Priority monitoring activity; the agency has little flexibility to adjust its intensity of monitoring in response to resource availability. The current network was initiated in 2001, following implementation of the 1st edition of the WQM Strategy.

As currently executed (FY2005), estimated annual resource expenditures for the Trend Monitoring Network are approximately $148,485 for analytical costs (at the state laboratory) and seven 'full-time equivalents' (FTEs) of human resources for fieldwork (~$280,000). Except for completing the integration of the NTMN in 2005, scheduled milestones deal mostly with trend analyses and exploratory data investigations.

2004 – WQ3 software updates were completed at a contractual cost of ~$20,000, provided by agency general funds. Required SAS analytical software updates and re-licensing costs were approximately $10,000, also provided by agency general funds.

2006 – Report on results of trend analysis in the 2006 305(b) Water Quality Assessment Report..

2007-2014 - The results of the exploratory data analyses and subsequent reports will determine whether future trend analyses will be sufficiently representative if performed on a six-year cycle to coincide with watershed rotations and 305(b) Assessment Reports.

(4) TMDL Support Program

Except for the planned completion schedule discussed in Chapter III, Design and Implementation, specific milestones, timelines and associated resource requirements are difficult to predict for the TMDL support program at this time. Estimated internal (agency provided) and external resource requirements for analyses

during the current (2005) fiscal year are summarized below. Expectations are that total TMDL resource requirements will increase geometrically, at least doubling over the next ten years. The current human resource requirements for TMDL-related field activities are difficult to estimate because they are integrated with those of other monitoring activities. As indicated elsewhere, however, the addition of one biologist position at each regional office would also provide much needed support for the geometrically increasing number of TMDLs studies, including benthic TMDLs, to be performed over the next ten years. (Estimated minimum annual cost would be approximately $240,000 for the seven additional positions, without considering fringe and indirect costs!)

2005 - Estimated 2005 analytical costs funded by the agency are approximately $52,854. Additional analytical expenditures for the fiscal year include an estimated $70,800 for bacterial source tracking, which is paid out of §319 and other TMDL funds. Both are expected to increase because of the increasing numbers of TMDLs and the fact that future TMDLs will, on average, be more complex and more expensive than those currently in progress!

2004-2014 – Please refer to the "Table of TMDL Monitoring Objectives 2004 – 2014" [IX-3.doc] for a list of the statewide and local TMDL objectives currently estimated for the next ten years.

(5) Special Studies Programs

Special studies programs, because they are generally established to resolve recently perceived or newly arising water quality problems, or to investigate new sampling or analytical methodologies, are by their very nature difficult to anticipate and document in terms of future expectations. This applies to both generic special studies and permit-related special studies, which are determined by regional permit planners. Both types vary considerably in their requirements for parameters analyzed, frequency of sampling, and duration.

Fish-tissue/Sediment-related Special Studies

When levels of toxic chemicals are detected in fish at elevated levels that are of concern, additional special studies are conducted to better determine the extent of the pollution. These special studies typically involve expanded sampling sites within the water body as well as additional fish species sampled.

Mercury in Fish in Swamps - Elevated mercury levels in fish were discovered in some species of fish during routine fish-tissue monitoring conducted in 2002 in the Dragon Run Swamp, the Blackwater river and the Great Dismal Swamp. The Virginia Department of Health issued fish consumption advisories for these areas in 2003. In 2004, DEQ is conducting additional, extensive collections of fish in these water bodies to better characterize the fish-mercury levels in these waters, and to determine if the current fish consumption advisories should be modified. There are no known industrial or other local sources of mercury in these water bodies. All three waterbodies are swampy in nature, with naturally low pH, low oxygen levels and high organic carbon concentrations. These natural conditions are known to promote the methylation of mercury and cause mercury to become magnified in the aquatic food web. DEQ has formed a Mercury Advisory Committee to help DEQ determine how to address this issue.

PCBs in Fish - Recent data from the routine Fish-Tissue Monitoring Program have indicated elevated levels of PCBs in fish in Knox Creek, Beaver Creek and Smith Mountain Lake, prompting new fish-consumption advisories for these waterbodies. DEQ is conducting expanded sampling of these waterbodies in 2004 to better characterize the PCB levels in fish in these waters, and to determine if the current fish-consumption advisories should be modified.

Ambient Toxics Special Studies

Toxic Trace Metals in Surface Waters – The interpretation of results from the freshwater and saltwater probabilistic monitoring will determine the direction for future monitoring of ambient waters. Until then the estimated resources are unknown.

As identified in Department Guidance, http://www.deq.virginia.gov/waterguidance/pdf/012011.pdf, the following milestones are expected:

2005 and beyond - As yet to be determined special studies related to toxics metals impairments, VPDES permit needs, and other pollution releases will occur. Estimated resources required are to be determined in Annual Monitoring Plans.

2010 - By 2010 targeted monitoring at Acid Mine Drainage sites will be initiated, as identified by a preliminary Department of Mines, Minerals, and Energy study. Estimated site numbers are approximately 1300 and will require approximately $490,000 in analytical costs to be spread out over approximately a 5-year period at an estimated 325 man days of field time.

2010 - Sampling of ancient spring waters and ground waters to determine pre-anthropogenic concentrations will begin. Estimated cost is $2000 and will require 15 man-days.

Toxic Trace Organics in Surface Waters – Although extremely expensive, the use of Semi Permeable Membrane Devices (SPMDs) in recent years has proved to be a viable methodology for monitoring trace toxic organics in ambient waters, as well as for targeted special studies. Depending upon resource availability, their use will be expanded in the future.

2005 - Increased use of passive sampling using Semi Permeable Membrane Devices will support an increasing number of TMDL special studies related primarily to PCB impairments. The target batch size for each PCB project is 10 samples with analytical costs of $33,000, supplies and equipment equaling $600, and man days equal to 5.

2010 - Other passive sampling technologies will be used to detect a broader range of organics with low octanol to water partitioning coefficients. Costs and manpower estimates are yet to be determined.

Estuarine Sediment Ambient Toxicity Special Study – The Estuarine Ambient Toxicity (AmbTox) Special Study Program is expected to continue for the next ten years, resources permitting. No specific milestones have been identified except for annual rotations among basins to increase geographic coverage. Resource requirements, provided by agency general funds, are currently approximately $65,000 annually. This provides for the existing level of sampling at 10-15 sites per year. An additional $20,000 per year would permit the desired expansion of the program to include approximately 20 probabilistic sites annually.

(b) Program Specific Monitoring

A number of monitoring programs integrated into the agency's overall Water Quality Monitoring Strategy are carried out by other offices within the agency, by independent organizations, or are resource-specific.

(1) Chesapeake Bay Monitoring Program

Numerous milestones and timelines within the Chesapeake Bay Monitoring Program are initiated by consensus among the members of the Monitoring and Assessment Subcommittee of the Federal-Interstate Chesapeake Bay Program, and not by specific state agencies.

Virginia-specific annual reporting of CBP monitoring results will be provided each year through (1) revisions/updates to the technical "Basin Summaries" for the James, York, and Rappahannock Rivers, and (2) annual reports to the VA General Assembly. Analysis and reporting of Virginia's CBP monitoring results will also be performed annually as part of Bay-wide efforts coordinated through the Monitoring and Assessment Subcommittee of the Federal-Interstate Chesapeake Bay Program. The monitoring data-collection components of the Tributary Water Quality Monitoring, Mainstem Water Quality Monitoring, Phytoplankton Community Monitoring, Benthic Community Monitoring, and River Input Monitoring components will continue basically unchanged through 2014.

2004 –A new monitoring component of Non-Tidal Water quality Monitoring will begin (see Non-Tidal Trend Monitoring Program description in Chapter III – Design and Implementation). Increased funding will be sought for the Shallow Water Habitat monitoring. Although a goal of the CBP is to remove all tidal waters from the DEQ 303(d) "Impaired Waters" list, it is estimated that under current funding levels Virginia will not have data sufficient to do a complete assessment of all new Bay criteria until approximately 2020. It is estimated that an increase of $625,000 in annual funding would be necessary to completely assess all of Virginia's Chesapeake Bay and major tidal tributaries for all aspects of the proposed new Bay criteria by 2010.

2005 – Applicable CBP monitoring data will be included in the preparation of the 2006 Integrated Water Quality Assessment Report to EPA. Increased funding will be sought for the Chesapeake Bay Non-Tidal Monitoring program in order to increase the number of "load" monitoring sites. Each site costs approximately $13,000/year for the collection of loading data, and the goal would be to upgrade five additional sites ($65,000/yr). If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.

2006 –The Shallow Water Habitat monitoring will be moved from the York River system to another system because it is on a 3-year rotational cycle that will have been completed there (*i.e.*, 2003 through 2005). Increased funding will continue to be sought for the Chesapeake Bay Non-Tidal Monitoring program to enhance the coverage of "load" sites ($13,000/year/site). If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.

2007 – Applicable CBP monitoring data will be included in the preparation of the 2008 Integrated Water Quality Assessment Report to EPA. If not yet obtained, increased funding will continue to be sought for the Chesapeake Bay Non-Tidal Monitoring program to enhance the coverage of "load" sites ($13,000/year/ site). If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.

2008 – If not yet obtained, increased funding will continue to be sought for the Chesapeake Bay Non-Tidal Monitoring program to enhance the coverage of "load" sites ($13,000/year/ site). If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.

2009 – Applicable CBP monitoring data will be included in the preparation of the 2010 Integrated Water Quality Assessment Report to EPA. The Shallow Water Habitat monitoring will again be moved from one system to another system because of it's a 3-year rotational cycle, which will have been completed (*i.e*. 2006 through 2008). If not yet obtained, increased funding will continue to be sought for the Chesapeake Bay Non-Tidal Monitoring program to enhance the coverage of "load" sites ($13,000/year/site). If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.

2010 – If not yet obtained, increased funding will continue to be sought for the Chesapeake Bay Non-Tidal Monitoring program to enhance the coverage of "load" sites ($13,000/year/site). If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.

2011 – Applicable CBP monitoring data will be included in the preparation of the 2012 Integrated Water Quality Assessment Report to EPA. If not yet obtained, increased funding will continue to be sought for the Chesapeake Bay Non-Tidal Monitoring program to enhance the coverage of "load" sites ($13,000/year/site). If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.

2012 – The Shallow Water Habitat monitoring will again be moved from one system to another because of its a 3-year rotational cycle, which will have been completed (i.e. 2009 through 2011). If not yet obtained, increased funding will continue to be sought for the Chesapeake Bay Non-Tidal Monitoring program to enhance the coverage of "load" sites ($13,000/year/site). If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.

2013 – Applicable CBP monitoring data will be included in the preparation of the 2014 Integrated Water Quality Assessment Report to EPA. If not yet obtained, increased funding will continue to be sought for the Chesapeake Bay Non-Tidal Monitoring program to enhance the coverage of "load" sites ($13,000/year/site). If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.

2014 – If not yet obtained, increased funding will continue to be sought for the Chesapeake Bay Non-Tidal Monitoring program to enhance the coverage of "load" sites ($13,000/year/site). If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.

(2) Lakes Monitoring Program

The Lakes Monitoring Program is considered to be a Priority Group 1 monitoring activity. It is considered important in providing broad-based comprehensive monitoring, but management discretion exists to reduce activities based on resource constraints. As with most other monitoring activities, increased resource availability could provide for expanded geographic coverage.

Although the Lakes Monitoring Program is considered to be a fully implemented component of DEQ's Water Quality Monitoring Program, several additional needs and their timelines for implementation are summarized below.

2004-2006 – The Lakes Monitoring Program has committed to accomplishing the following three objectives during this time frame:

(1) develop recommendations for reduced frequency/innovative monitoring under reduced resources,
(2) complete regulatory lake nutrient criteria development and implementation, and
(3) resolve dissolved oxygen assessment issues.

No additional resource requirements are anticipated, beyond the Lake Program's general budget that is providing approximately $20,000 the participation of an Academic Advisory Committee during fiscal year 2005.

2007-2008 – Parameter coverage will be reviewed, and the establishment of newly developed nutrient standards will be established during the normal triennial WQS review and amendments process. No additional resource requirements are anticipated.

(3) Citizens Monitoring Program

Support for the Citizens Monitoring Program is considered a Priority Croup 2 monitoring activity. Support for monitoring by citizens provides the Commonwealth with broad-based supplemental data, however discretion exists to reduce resources dedicated to this activity based on budgetary constraints.

Total resources currently required for this program (including grants to citizen monitoring groups) are approximately $100,000/year, plus one FTE, Pay Band 5, at an approximate cost of $40,000/year (plus benefits).

2004-2006 – (1) DEQ will promote the use of a dissolved oxygen titration standard that will enable the use of dissolved oxygen data from citizen groups for directly listing impaired waters by 2008. (2) The role of the Citizen Monitoring Coordinator will be broadened and renamed as the Water Quality Data Liaison (WQDL) coordinator. Expanded duties will include the solicitation and evaluation of all non-DEQ water quality monitoring data for potential use in the 305(b) Assessment. (3) The development of a database for non-agency water quality monitoring data will be initiated. (4) The WQDL will implement new agency guidance to evaluate where follow-up monitoring by DEQ is most needed in response to citizen monitoring, citizen nominations, and citizen concerns. [Section VII of DEQ's Water Quality Monitoring Consolidated Guidance Memorandum (Guidance Memorandum No. 04-2005 [VII-1a.pdf]) deals specifically with this subject.] Fifty-eight such sites will be monitored by DEQ in 2004-2005. (5) Grants to support citizens' monitoring activities will be re-established in 2004 and will continue year-by-year as funding allows.

2007-2009 – DEQ will incorporate more citizens' monitoring data (and other non-agency data) into the 305(b) Assessment process.

(4) Biological Monitoring Program

The Biological Monitoring Program is considered to be a Priority Group 2 monitoring activity. It is considered important in providing broad-based comprehensive monitoring, but management discretion exists to reduce activities based on resource constraints. Increased resource availability could provide for research on and the possible inclusion of additional biological assemblages, the possible expansion of habitat analyses, and expanded geographic coverage.

The Biological Monitoring Program also provides the majority of the specialized human resources for the statewide Freshwater Probabilistic Monitoring Program, which will complete its first five-year cycle in 2005, as well as necessary support to the TMDL Program. The desire for and necessity of additional regional biologist's positions are discussed there, as well as being mentioned in the section on TMDL Support Monitoring. One additional biologist (Salary Band 5) per regional office, if approved, would require approximately $240,000 annually, and would contribute significantly to the support of all three programs.

2004 – A full time Coordinator will be hired for the Biological Monitoring Program. This new position was established in 2004. (Annual resource requirements of ~$40,000 plus benefits are already provided.)

2004-2005 – The Program will work with an Academic Advisory Committee (AAC) to facilitate implementation of the newly developed Stream Condition Index (SCI). Resources for funding the AAC's participation during fiscal year 2005 have been provided from the WQS Unit budget.

(5) Targeted Fish Tissue and Sediment Monitoring Program

The Targeted Fish Tissue and Sediment Monitoring Program is considered to be a fully implemented, Priority Group 2 component of DEQ's WQM Program. It is important in providing broad-based comprehensive monitoring, but management discretion exists to reduce activities based on resource constraints. Increased

resource availability (minimum of $150,000) would allow the acceleration of the current 5-year statewide sampling rotation cycle to a 3-year rotation cycle.

Two additional FTEs are required to maintain this program at its current level. At present, the program depends upon part-time support from personnel assigned to other monitoring activities. The additional positions would require approximately $60,000 annually, plus benefits.

No new milestones / initiatives are currently planned for this program, except for continuing and completing the currently planned basin rotation schedule.

(6) Wetlands Monitoring Program

DEQ's Wetlands Monitoring Program is currently being designed and implemented by the agency's Office of Wetlands, Water Protection and Compliance with the aid of an EPA State Wetland Development Grant (CD 983815-01). Resources for 2004-2006 are provided by the original grant, and milestones and timelines for the period are described therein.

2004 – The final Wetlands Monitoring & Assessment Strategy, currently under internal agency review, is due to EPA by September 1. A public workshop on the Monitoring and Assessment Strategy is scheduled by September 30.

2005 – The Final Report for the Floristic Study is due to EPA by July 31. A peer review workshop on Wetland Assessment Methodologies is also scheduled by July 31. The QMP, QAPP, and Sampling Plan for Level 3 Assessment in Coastal Plain (to be produced by VIMS) are due to EPA by September 30. The Final Analysis and Report for Level 2 Assessment by Watershed (also to be produced by VIMS) is due to EPA by October 31.

2006 – The complete Wetland Inventory for the 2006 305(b) Report is due to EPA by April 30.

2007-2014 – The establishment of milestones and timelines for this period is dependent upon the results of the strategy and inventory reports described above.

(7) Surface Water Investigations Program

This program is independent of, but intimately integrated with the Water Quality Monitoring Program.

2004 – GOES Satellite equipment was purchased in FY2004 for the conversion of 67 DEQ-operated surface water (SW) gauging stations to real-time satellite transmission. Eleven ground water (GW) wells were converted to satellite transmission of GW quantity data. Surface and ground water quantity data were submitted to the USGS for publication in April

2005 - Conversion of 67 stream gages to Satellite transmission will be completed. SW (67 gauges) and GW (~170 wells) data will be submitted to USGS for publication by April.

2006-2014 – SW and GW data will be submitted to USGS for inclusion in Water Resources Data for Virginia publication by April of each year. Annual maintenance of the SWI monitoring network will continue.

(8) Ground Water Monitoring Program

Although the agency does monitor ground water availability (quantity), DEQ does not have a ground water quality monitoring program. Current agency activities related to ground water quality are restricted to the

Ground Water Protection Program and monitoring only for TMDL special studies where groundwater impacts influence surface water quality.

DEQ acknowledges the importance of establishing a Ground Water Quality Monitoring Program, as guidance and resources become available. The complexity of such an undertaking and the lack of expertise within the agency prevent us from estimating resource and time requirements at this time. As indicated elsewhere in this document, the design, implementation and maintenance of a comprehensive, statewide ground water monitoring program would potentially require, or possibly even exceed, the human and financial resources and time requirements invested in developing the current Surface Water Quality Monitoring Programs.

The only commitment that the agency is able to consider at this time is, within the next ten years, hiring an experienced consultant (or possibly establishing a permanent position) to:

(1) research other currently existing ground water monitoring programs,
(2) seek guidance from whatever sources are available, and
(3) design a comprehensive ground water monitoring program for the Commonwealth of Virginia with estimates of the associated resource requirements.

Estimated annual resource requirements for a permanent position would be approximately $50,000, plus fringes and indirect costs (58.5%). Accomplishing this objective through contracted consultant services would conceivably cost $200,000 or more.

(9) BEACH Monitoring Program

The Division of Zoonotic and Environmental Epidemiology of the Virginia Department of (VDH) administers the BEACH Monitoring Program. DEQ's primary role in this program is the inclusion of the bacterial monitoring results in the biennial 305(b) assessment process. Because the program is in its first year, coordination between the two agencies and guidance for 305(b) assessment methodologies are still being defined. No specific resource requirements are anticipated by DEQ, although a timeline has been established for completing the coordination and assessment methodology requirements.

2005 – (April) Completion of the interagency coordination requirements with VDH (data form and format, data transfer protocols); completion of assessment guidance for the use of BEACH monitoring 'swimming advisory' and bacterial data for 305(b) reporting.

(c) Water Quality Standards Program

The majority of the scheduled milestones and timelines associated with the Water Quality Standards Program are either directly or indirectly related to the required triennial review process. Future triennial reviews are scheduled for completion in 2007, 2010 and 2013. The performance of Use Attainability Analyses (UAAs) is continuous (2004-2014) and they are normally adopted as part of triennial reviews. The schedule for completing UAAs is completely dependent upon the availability of human and financial resources, which vary with each study and are difficult to predict at the present time.

2005-2014 – Use Attainability Analyses will be performed on a continuing basis, as resources become available, and will be adopted as part of the triennial review process.

2005 - Estuarine nutrient criteria will be adopted and submitted to EPA for review and approval.

2006 - Reservoir & Lake nutrient criteria will be adopted and submitted to EPA for review and approval.

2007 – Triennial Review scheduled for completion. River & Stream nutrient criteria will be adopted and submitted to EPA for review and approval.

2010 - Triennial Review scheduled for completion.

2013 - Triennial Review scheduled for completion.

2. Final Note

It must be emphasized one last time that the attainment of objectives for new initiatives within the estimated timelines is dependent upon the availability of increased resources… the prospects of which are uncertain under existing economic conditions.

Chronology of WQM Task Force Activities and Strategy Evolution				
Target Date	**Accomplished Date**	**Task Description**	**Responsible Person(s)**	**WQMIRA Items**
17-Jul-97	31-Jul-97	Initial Water Quality Monitoring Meeting Establishing the Task Force	full committee	1 thru 5
24-Sep-97	24-Sep-97	Task Force Progress Meeting	full committee	1 thru 5
3-Oct-97	3-Oct-97	WQAP to establish data format for survey addresses	roger stewart	2
3-Oct-97	31-Oct-97	Interim implementation plan to management	charlie morgan & roger stewart	1 thru 5
24-Oct-97	1-Dec-97	Information from regions for data survey	regions	2
31-Oct-97	10-Nov-97	Data user needs from planners	planners	2
1-Nov-97	4-Nov-97	Mail survey	charlie morgan & roger stewart	2
1-Nov-97	2-Dec-97	Mail survey	charlie morgan & roger stewart	2
12-Nov-97	12-Nov-97	Task Force Progress Meeting	committee chairs	5-Jan
1-Dec-97	13-Nov-97	DCRs data needs	charlie morgan & roger stewart	1 and 2
1-Dec-97	4-Dec-97	Final report of data users due	charlie morgan & roger stewart	2
1-Dec-97	29-Dec-97	Results of survey due or cutoff	charlie morgan & roger stewart	2
1-Jan-98	14-Jan-98	Final report of data users due	charlie morgan & roger stewart	2
5-Jan-98	14-Jan-98	Task Force Progress Meeting	full committee	5-Jan
30-Jan-98	10-Apr-98	Hiring of the monitoring coordinator	roger stewart	5-Jan
1-Feb-98	3-Mar-98	Format regional monitoring plan include lab projections	mark alling & larry willis	1
12-Feb-98	26-May-98	Completion of users interviews	charlie morgan & roger stewart	2
4-Mar-98	3-Mar-98	Task Force Progress Meeting	full committee	5-Jan
13-Mar-98	23-Mar-98	Station List Subcommittee attribute list	station listing subcommittee	1
30-Apr-98	1-May-98	Regional & SRU & CBP & SWI monitoring plans due	regions and CO	1
1-May-98	1-May-98	Segment delineation guidance	mark alling & jon van soestberger	2
14-May-98	13-May-98	Task Force Progress Meeting	full committee	5-Jan
30-May-98	1-Apr-98	Station siting plan and schedule to address statewide coverage	station siting subcommittee	1,2,5
30-Jun-98	postponed until next cycle	Public notice of the annual monitoring plan for FY1999, 303(d) listings, and assessment protocol	WQAP monitoring coordinator	3
1-Jul-98	2-Sep-98	Task Force Progress Meeting Discussion of new station siting plan	planning & monitoring	5-Jan
4-Sep-98	4-Sep-98	Instructions on Master Station List	don smith	1
30-Sep-98	30-Sep-98	Comments on Data Users Survey to Charlie Morgan and Roger Stewart	full committee	2
1-Oct-98	1-Oct-98	Re-Updated Master Station Lists due to Don Smith	Regional, WQS, CBP	1
8-Oct-98	8-Oct-98	First meeting of the Lake Monitoring Subcommittee	Lake Guidance Subcommittee	1,2
20-Oct-98	22-Oct-98	Task Force Progress Meeting	WQAP	5-Jan
10-Dec-98	10-Dec-98	Data Management Subcommittee Meeting	subcommittee	1
18-Dec-98	18-Dec-98	Comments on DEQ Monitoring Strategy Document Proposal to Station Siting subcommittee chair Mark alling	mark alling	1,2
1-Jan-99	15-Jan-99	DCRs data needs	charlie morgan & roger stewart	1,2
12-Jan-99	22-Jan-99	Lakes Monitoring Subcommittee Meeting	subcommittee	1,2
15-Jan-99	11-Feb-99	Lake Monitoring Guidance Process Identified	Lake Guidance Subcommittee	1,2
29-Jan-99	29-Jan-99	First Biomonitoring subcommittee meeting	Biomon	1,2,4
11-Feb-99	11-Feb-99	Lakes Monitoring Subcommittee Meeting	subcommittee	1,2
16-Feb-99	16-Feb-99	Station Siting Subcommittee Meeting	full subcommittee	1,2
17-Feb-99	17-Feb-99	Task Force Progress Meeting	WQMTF	5-Jan
22-Feb-99		Issue papers due to Biomonitoring Subcommittee	lou seivard	1,2,4
3-Mar-99		Biomonitoring Subcommittee Meeting	subcommittee	1,2,4
16-Mar-99	14-Apr-99	Task Force Progress Meeting	WQMTF	5-Jan
1-Apr-99	1-May-99	regional & SRU & CBP & SWI monitoring plans due	regions and CO	1
1-May-99	23-Jul-99	DRAFT Water Quality Monitoring Strategic Plan Document Completed	don smith	5-Jan
1-Jul-99	1-Jul-99	Regional Lakes Monitoring Pilot Study to Begin	Regional Monitoring	1,2
27-Jul-99	27-Jul-99	Task Force Progress Meeting	WQMTF	5-Jan
17-Aug-99	17-Aug-99	Budget due to Francis	CO	5-Jan
22-Sep-99	22-Sep-99	Budget due to DPB	Executive Management	5-Jan
1-Dec-99	1-Dec-99	Budget due to Govenor	Executive Management	5-Jan
17-Dec-99	17-Dec-99	Govenor's Budget due to General Assembly	Govenor's Office'	5-Jan
31-Dec-99	31-Dec-99	Strategy due to EPA as stipulated in DEQ/EPA/DCR agreement	CO	5-Jan

COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Water Division

Subject: Guidance Memo No. 03-2004
Managing Water Monitoring Programs While Under Reduced Resources

To: Regional Directors

From: Larry G. Lawson, P.E., Director

Date: February 10, 2003

COPIES: John Daniel, Karen Sismour, Alan Pollock, Darryl Glover, Regional Deputy Directors, Regional Water Permit Managers, Regional Compliance & Enforcement Managers, and Regional Water Monitoring Managers

Summary: This memo aids in implementing Virginia's Water Quality Monitoring Strategy during periods of reduced resources.

Electronic Copy:

The full text of this guidance is distributed electronically. The full text may be obtained at:
http://deqnet/docs/default.asp?path=./main/water/Guidance_Memoranda/2003_Guidance_Memos

You may navigate to this document by signing on to DEQNET then:
Click on the "Documents and Forms" tab.
Click on the link: "To view a list of files presently on DEQNet2 > click here".
Click on the "Water" folder.
Click on "Guidance Memoranda" folder.
Click on the appropriate year.
Click on the appropriate guidance document.

These electronic copies are in PDF format and may be read online, downloaded, distributed to the staff or the public. The numbering convention is: GM, then a two-digit number designating the year of preparation, followed by a hyphen and the document number.

Contact information:

For more information, please contact Darryl Glover, Water Quality Monitoring and Assessments, at (804) 698-4321, or e-mail: dmglover@deq.state.va.us.

Disclaimer:

This document is provided as guidance and, as such, sets forth standard operating procedures for the agency. However, It does not mandate any particular method nor does it prohibit any particular method for the analysis of data, establishment of a wasteload allocation, or establishment of a permit limit. If alternative proposals are made, such proposals should be reviewed and accepted or denied based on their technical adequacy and compliance with appropriate laws and regulations.

Managing Water Monitoring Programs
While Under Budget Constraints

To aid in implementing Virginia's Water Quality Monitoring Strategy during periods of reduced resources [in terms of both FTEs and non-personal services], DEQ monitoring activities are divided into the following two groups:

- Group 1 - Limited Discretion to Reduce Activities
  The agency recognizes there is little management discretion to reduce resources dedicated to these monitoring activities due to the need to: 1. minimize environmental damage from pollution incidents; 2. provide key agency programs with needed data in a timely fashion; 3. meet commitments made by the Commonwealth; and/or, 4. ensure consistency and usefulness for statewide application of data. Every effort should be taken to fully implement the monitoring plans for these activities, including reduction in monitoring resources for activities listed in Group 2. Activities are listed in priority order.

- Group 2 - Management Discretion to Reduce Activities
  These monitoring activities are considered important in providing a broad-based, comprehensive monitoring program for the Commonwealth. The goal is to conduct as much monitoring in these areas as resources allow to achieve the objectives in the Monitoring Strategy. However, management discretion exists to reduce resources dedicated to these activities based on budget constraints, either at the statewide or regional level. Any reduction in resources should be designed to maintain a balanced investment in each of these monitoring activities. No monitoring component should be entirely eliminated in any year without consultation among CO and RO staff. Activities not listed in priority order.

Group 1	Comments
Incident Response & Pollution Complaint	Investigation of pollution incidents is a top priority to minimize damage to environment.
TMDL monitoring	Commonwealth is committed to developing TMDLs in accordance with a federal court Consent Decree schedule. Supporting monitoring data is critical to completion of these TMDL special studies. Once a TMDL has been completed, monitoring can temporarily discontinue until the DEQ TMDL staff determines that implementation measures to address the source(s) of impairments are being installed. Monitoring can resume at the start of the following fiscal year, next scheduled monitoring station rotation, or where deemed necessary by the regional office or TMDL staff, as a new special study.
Chesapeake Bay Water monitoring	Commonwealth has committed to conducting monitoring of its portion of the Bay and its tributaries consistent with other Bay states.
Probabilistic monitoring	All regions need to complete their assigned probabilistic stations in order for DEQ to make defensible conclusions about water quality from a statewide perspective. The expanded habitat assessment methods for biological monitoring should be employed at the probabilistic sites.
Trend Stations	Trend analysis suffers from an interrupted data set.
Grant Funded monitoring or Other Non-General Funds	Seek grant funds based on adequate manpower and resources for match requirements. Implementation is required to meet agency grant commitments. Use non-general funds as needed and available and meet requirements for their use.

Group 2	Comments	Guidelines and Considerations for Reducing Monitoring Activity
Ambient Rotating Watershed Monitoring	Expands the geographic coverage of the ambient monitoring program - Contingent on the availability of adequate funding.	Parameters have already been reduced for FY04 No less than one station at the mouth of each watershed is suggested
Biological Monitoring [wadeable streams]	Continue enhancement of biological monitoring to include location of new reference stations, routine ambient stations, and inclusion of habitat assessment, as resources allow.	Each DEQ Regional Biologist currently monitors approximately 20-30 sites twice a year. The sites to be monitored should be prioritized in the following order (highest to lowest): a) Current reference sites, b) Sits involving immediate TMDL issues, c) Additional sites of special concern to the Regions and additional reference sites.
Lakes Monitoring	Implement lakes monitoring strategy to the extent allowed by budget.	a) Reduce the number of publicly accessible priority lakes monitored, per WQMIRA, to reflect the resources available in any given year. b) Retain for each priority lake selected for monitoring, per Guidance Memo No. 02-2004, a minimum sampling frequency of once monthly from April through October for one calendar year. c) Some "High Priority" lakes may warrant a sampling schedule above the minimum guidance requirement of seven runs (Apr.-Oct.) in one year out of the five. This is due to issues such as high recreational usage, shoreline development, or citizen concern. Such lakes may be monitored at a lesser frequency to be determined by the region once the minimum sampling frequency requirement of the lake guidance is met.
Citizen Monitoring	Support for citizen monitoring provides the Commonwealth with supplemental data.	Most regional offices spend little time assisting citizen groups except for giving advice on monitoring sites and following up on problems detected by citizen monitoring efforts. Such efforts could be prioritized as follows: a) Immediate and acute situation detected would be treated as a pollution complaint under Group 1 monitoring priorities. b) If citizen monitoring results in a 305(b) listing as a "Water of Concern" (formerly called threatened) it would be prioritized per "Threatened Waters" under Group 2. c) If indications are that there might be a concern, monitoring staff should evaluate and determine if a field visit is warranted. Citizen nominations for additional monitoring by DEQ can also be ranked: a) Waters in an area of high recreational use b) Waters that can be incorporated into the current or upcoming watershed rotation c) Waters that are a "Water of Concern" d) Waters in an area of another environmental concern e) Other specific local factors
Fish Tissue Monitoring	WQMIRA calls for an increase in the rate and amount of monitoring, contingent on the availability of adequate funding.	When fish-tissue-monitoring data indicate a potential area of concern due to elevated contamination levels and/or VDH requests such a study, special more intensive follow-up sampling will need to be performed. Special follow-up sampling of fish tissue by central office staff will need to be considered on a case-by-case basis as it is difficult to predict a level of follow-up monitoring that may be needed in any given year. Where appropriate, action plans should be submitted to the Agency Director for consideration for funding from VEERF in order to use available central office unit budget funds for continuation of the statewide fish tissue containment-monitoring program. Adequate routine fish tissue monitoring coverage on a statewide basis required approximately 300 sites to monitor all Virginia river basins during the last period of statewide monitoring. This involved sampling approximately 90-100 sites per year in order to accomplish this in slightly more than a three-year period (WQMIRA urged DEQ to convert to a three-year monitoring plan to cover the entire state if funding were available). a) Reverting back to a five-year statewide river basin monitoring rotation due to anticipated budgetary constraints and the recent reductions in central office staffing for this program would require approximately 60 site visits per year representing a 30-40% reduction in yearly effort. b) Recent wage staff reductions in the central office fish-tissue monitoring unit will require that staff from other central office OWQP units must be temporarily borrowed to assist in field collections in order for this reduced level of fish tissue monitoring to be accomplished in 2003. Even with this borrowed staff it may only be possible to monitor approximately 50 stations in calendar year 2003. This will be about a 50% reduction from the calendar year 2002 routine fish tissue contaminant-monitoring program.

Group 2	Comments	Guidelines and Considerations for Reducing Monitoring Activity
Other Special Studies		Conduct as priorities dictate and resources permit.
Chesapeake Bay Biological Monitoring	Valuable as overall assessment of Bay health status and restoration targets.	Extent of monitoring is based on contractual funds dedicated to this effort.
Chesapeake Bay Ambient Toxicity Monitoring	Provides information called for under the CBP Toxics Strategy.	Scope of monitoring could be scaled back according to available funding; for a viable study, a minimum of 4 stations per stratum is required. The number of strata utilized is based on several variables (land use within study area, salinity, sediment type, etc.)
Kepone	Information needed by VDH to assess the status of Kepone contamination within the existing general advisory area.	a) The Kepone monitoring effort was recently reduced from every year to once every two years. The analytical budget was also reduced by 50% so that only one half of the normal samples can be analyzed. This represents a 50% reduction in staff time and a 75% reduction in analytical funds over a two-year period. b) No monitoring is scheduled for 2003. The next monitoring would be in 2004 c) After the data for the fish collected in 2002 becomes available, DEQ will consult with the Virginia Department of Health to determine if monitoring efforts in 2004 and beyond can be further reduced. Monitoring on a less frequent basis such as every fifth year will be considered.
Sediment Monitoring (on its own)	Both the federal 106 program and the state WQMIRA specifically require sediment monitoring, so it is not feasible to eliminate the sediment monitoring.	Collecting one sediment sample at each fish-tissue-monitoring site under the reduced five-year routine fish-tissue monitoring program described under that monitoring heading would represent an approximate 50% reduction in yearly sediment monitoring analytical costs.
Threatened Waters (Waters of Concern)	Required by WQMIRA and increasingly expected by EPA as 303(d) follow-up.	The following factors are ranked from highest to lowest: a) Fish Tissue Threatened (skip an assessment cycle and return to such sites) b) Single-sampled moderately impaired benthic sites. c) Lower exceedences of numeric standards d) Nutrient enriched waters e) Citizen monitored areas needing follow up

Implementation Plan and Schedule for of the VA-DEQ Water Quality Monitoring Strategy

This matrix is intended for the historical documentation of Strategy development as well as for future planning!

(Hidden columns for years prior to 2004 can be 'unhidden' for review!)	Milestones Achieved	Upcoming Milestones	Unattained or Postponed Milestones								
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
WQM Program Component											
305(b) / 303(d) Assessment - Listing and Reporting	2004 Report under review (March)		2006 Report Due (April) (last with 5-yr window)		2008 Report Due (April) (first with 6-yr window)		Report Due (April) (6-yr window)		Report Due (April) (6-yr window)		Report Due (April) (6-yr window)
Monitoring Plan Development	April 1st MonPlan for MY2005	April 1st MonPlan for MY2006	April 1st MonPlan for MY2007	April 1st MonPlan for MY2008	April 1st MonPlan for MY2009	April 1st MonPlan for MY2010	April 1st MonPlan for MY2011	April 1st MonPlan for MY2012	April 1st MonPlan for MY2013	April 1st MonPlan for MY2014	April 1st MonPlan for MY2015
WQM Strategy Evolution	Draft Revision - 2nd Edition - Submitted (March) Revised draft for public comment (August) and to EPA (September)	2nd Edition Implemented (July)	Second Revision of WQM Strategy begun (April)	Draft 3rd Edition Submitted (March)	3rd Edition Implemented (July)				Revision Initiated (April)	Draft Revision Submitted (March?)	4th Edition Implemented (July)
		Review implementation schedule for previous year and upcoming year! (October)	Review implementation schedule for previous year and upcoming year! (October)	Review implementation schedule for previous year and upcoming year! (October)	Review implementation schedule for previous year and upcoming year! (October)	Review implementation schedule for previous year and upcoming year! (October)	Review implementation schedule for previous year and upcoming year! (October)	Review implementation schedule for previous year and upcoming year! (October)	Review implementation schedule for previous year and upcoming year! (October)	Review implementation schedule for previous year and upcoming year! (October)	Review implementation schedule for previous year and upcoming year! (October)
Ambient Monitoring Programs											
Watershed Monitoring Network											
		Extra year carry-over for synchonization!	Rotation (yrs 6-7 of 1st cycle) (1 July)		Second Rotation Cycle Begins (1 July) (2008-2014)		Rotation (yrs 3-4 of 2nd cycle) (1 July)		Rotation (yrs 5-6 of 2nd cycle) (I July)		Second Rotation Cycle Ends (30Jun) and Third Begins (1July)
			Complete evaluation of 1st and 2nd order stream monitoring; increase emphasis if necessary.								
Probabilistic Monitoring Networks											
Free-running Freshwater ProbMon	Continued with Revision (Year 4)	Continue with Revision (Year 5) Evaluate results of 1st five years: (1) Evaluate relative susceptability of 1st and 2nd order streams to NPS (2) Redesign, redefine or eliminate program?	Continued…? Resources permitting, an additional 5-year block of freshwater ProbMon is the current plan.								
	Initiation of algal diversity, biomass and chlorphyll studies in wadeable streams for IBI development. (training - Jul, sampling - Aug-Nov)	Conclusion of algae studies with final report and data from the Philadelphia Academy of Natural Sciences (August)									
Estuarine ProbMon (Coastal 2000 / National Coastal Assessment)	Coastal 2000 / NCA continued - 5th Year (EPA grant expires)	Estuarine ProbMon Integrated with CBP Benthic IBI ProbMon	Continued…? (Depends upon available resources - state and federal!)	Continued…? (Depends upon available resources - state and federal!)	Continued…? (Depends upon available resources - state and federal!)	Continued…? (Depends upon available resources - state and federal!)	Continued…? (Depends upon available resources - state and federal!)	Continued…? (Depends upon available resources - state and federal!)	Continued…? (Depends upon available resources - state and federal!)	Continued…? (Depends upon available resources - state and federal!)	Continued…? (Depends upon available resources - state and federal!)
	Integration with CPB B-IBI ProbMon approved (May)	Two partial 5-yr summary reports [see text] are scheduled for completion (by June)	Overall 5-year summary report on characterization of Virginia's estuarine waters	Evaluation of conditions in Virginia's large Coastal Bays (Chincoteague Bay, Back Bay, etc.)			Second five-year characterization report on Virginia's estuarine waters				
	Design and execute side-by-side comparison of Young and Petite Ponar benthic grab samplers	Final report due on side-by-side study: comparison of IBI scores from two methods (by June)									
Trend Network	WQ3 received - Trend Analyses begun with WQ3	Exploratory data analyses…	WQ3 Trend Analyses in 305(b) Report	Exploratory data analyses…	WQ3 Trend Analyses in 305(b) Report?	Evaluate and apply appropriate frequency for repeating trend analysis reports…					
	CBP Non-Tidal Trend Network expanded - integrated with DEQ Network (Jul-Oct)										
TMDL Program											
	2003 - 2004 TMDL Schedule		2005 - 2006 TMDL Development Schedule								
	Please refer to the "Table of TMDL Monitoring Objectives 2004 – 2014" [IX-3.doc] for a list of the statewide and local TMDL objectives currently estimated for the next ten years.										
Special Studies Program											

Implementation Plan and Schedule for of the VA-DEQ Water Quality Monitoring Strategy

This matrix is intended for the historical documentation of Strategy development as well as for future planning!

(Hidden columns for years prior to 2004 can be 'unhidden' for review!)	Milestones Achieved	Upcoming Milestones	Unattained or Postponed Milestones								
WQM Program Component	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Fish-tissue/Sediment-related Special Studies	Conduct special mercury-fish contamination surveys in Dragon Run, Blackwater River, and Great Dismal Swamp. Conduct PCB-fish contamination surveys in Knox Creek, Beaver Creek and Smith Mountain Lake.	Work with Mercury Advisory Committee to determine ways to address elevated levels of mercury detected in fish in mercury sensitive waters. Evaluate 2004 data to determine need for follow-up studies needed in 2006	Evaluate data from the previous year's monitoring to determine need for follow-up studies needed in the following year.	Evaluate data from the previous year's monitoring to determine need for follow-up studies needed in the following year.	Evaluate data from the previous year's monitoring to determine need for follow-up studies needed in the following year.	Evaluate data from the previous year's monitoring to determine need for follow-up studies needed in the following year.	Evaluate data from the previous year's monitoring to determine need for follow-up studies needed in the following year.	Evaluate data from the previous year's monitoring to determine need for follow-up studies needed in the following year.	Evaluate data from the previous year's monitoring to determine need for follow-up studies needed in the following year.	Evaluate data from the previous year's monitoring to determine need for follow-up studies needed in the following year.	Evaluate data from the previous year's monitoring to determine need for follow-up studies needed in the following year.
Ambient Toxics-related Special Studies											
Monitoring Toxic Trace Metals in Surface Waters	Clean Metals sampling occuring at all probabilistic sites (freshwater and estuarine)	Clean Metals sampling occuring at all probabilistic sites (freshwater and estuarine)	Clean Metals sampling to be continued at all probabilistic sites (freshwater and estuarine)?				Monitoring of toxic trace metals at all Department of Mines Minerals and Energy's abandon Acid Mine Drainage Sites. Begin sampling at ancient water for pre-anthropogenic background historic levels.				
Monitoring Toxic Trace Organics in Surface Waters	Increase use of SPMD methods to identify PCB sources in Impaired waters via several special studies.						Incorporate Standard Operating Procedures for SPMDs. Shift analytical methodology for routine sampling from USGS to DCLS.				
Estuarine Sediment Ambient Toxicity Special Study		Continued at present level of sampling, with annual rotation of study areas…									
Program Specific Monitoring											
Chesapeake Bay Program											
General		Applicable CBP monitoring data will be included in the preparation of the 2006 Integrated 305(b)/303(d) Report		Applicable CBP monitoring data will be included in the preparation of the 2008 Integrated 305(b)/303(d) Report		Applicable CBP monitoring data will be included in the preparation of the 2010 Integrated 305(b)/303(d) Report		Applicable CBP monitoring data will be included in the preparation of the 2012 Integrated 305(b)/303(d) Report		Applicable CBP monitoring data will be included in the preparation of the 2014 Integrated 305(b)/303(d) Report	
Non-Tidal Trend Network Monitoring	July - Non-Tidal Trend Network established	Increased funding will be sought to increase the number of "load" monitoring sites ($13,000/year/site)	Increased funding will continue to be sought for the Chesapeake Bay Non-Tidal Monitoring program to enhance the coverage of "load" sites.	If not yet obtained, increased funding will continue to be sought for the Chesapeake Bay Non Tidal Monitoring program to enhance the coverage of "load" sites	If not yet obtained, increased funding will continue to be sought for the Chesapeake Bay Non Tidal Monitoring program to enhance the coverage of "load" sites	If not yet obtained, increased funding will continue to be sought for the Chesapeake Bay Non Tidal Monitoring program to enhance the coverage of "load" sites					
Shallow Water Habitat Monitoring	Increased funding will be sought for the Shallow Water Habitat monitoring	If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.	Monitoring will be moved from the York River system to another system (3-yr cycle)	If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.	If not yet obtained, increased funding will continue to be sought for the Shallow Water Habitat monitoring.	Monitoring will again be moved from one system to another system because of it's a 3-year rotational cycle			Monitoring will again be moved from one system to another system because of it's a 3-year rotational cycle		
Lakes Monitoring Program	Develop recommendations for reduced frequency/innovative monitoring under reduced resources; regulatory lake nutrient criteria development and implementation; resolution of dissolved oxygen assessment issues.			Review parameter coverage: WQS-triennial amendments			Review parameter coverage: WQS-triennial amendments	Assess feasibility/cost of adding benthic/algal biomonitoring		Review parameter coverage: WQS-triennial amendments	
Citizens Monitoring Program	Promote the use of a dissolved oxygen titration standard that will enable the use of dissolved oxygen data from citizen groups for directly listing impaired waters by 2008.										

Implementation Plan and Schedule for of the VA-DEQ Water Quality Monitoring Strategy

This matrix is intended for the historical documentation of Strategy development as well as for future planning!

(Hidden columns for years prior to 2004 can be 'unhidden' for review!)

Legend: **Milestones Achieved** | **Upcoming Milestones** | **Unattained or Postponed Milestones**

WQM Program Component	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	The role of the Citizen Monitoring Coordinator will be broadened and renamed as the Water Quality Data Liaison (WQDL) coordinator.	Development of a database for non-agency water quality monitoring data will be initiated. The WQDL will implement new agency guidance to evaluate where follow-up monitoring by DEQ is most needed in response to citizen concerns.		DEQ will incorporate more citizens' monitoring data (and other non-agency data) into the 305(b) Assessment process.							
	Grants to support citizens' monitoring activities have been re-established in 2004 and will continue year-by-year as funding allows.										
Biological Monitoring Program	Hire full time staff member for coordination of Biomonitoring Program.	Complete first five-year cycle of state-wide probabalistic monitoring .	Finalize up-dated SOP and QA/QC procedures.		Evaluate implementation of Stream Condition Index. Recommend modifications if necessary	Evaluate monitorig additionl biological communities such as fish or periphyton.		Evaluate Stream Condition Index and determine need for recalibration or adjustments.	Evaluate methods for assessing non-wadable streams and consider adding this to program, subject to resource availability.		
	Work with Academic Advisory Committee to develop implementation of Stream Condition Index										
Targeted Fish-tissue and Sediment Program	Begin first year of the next five year rotation of river basins	Prepare 2005 monitoring plan by March 31, 2005. Conduct monitroing by October.	Prepare 2006 monitoring plan by March 31, 2006. Conduct monitoring by October.	Prepare 2007 monitoring plan by March 31, 2007. Conduct monitroing by October.	Complete five-year rotation monitoring of river basins	Prepare 200 monitoring plan by March 31, 200. Conduct monitroing by October.	Prepare 2010 monitoring plan by March 31, 2010. Conduct monitoing by October.	Prepare 2011 monitoring plan by March 31, 2011. Conduct monitroing by October.	Prepare 2012 monitoring plan by March 31, 2012. Conduct monitoring by October.	Prepare 2013 monitoring plan by March 31, 2013. Conduct monitoring by October.	Prepare 2014 monitoring plan by March 31, 2014. Conduct monitoring by October.
Wetlands Monitoring Program	Final Wetlands Monitoring & Assessment Strategy due (1 September)	Final Report for Level 2 Assessment (October)	Complete Wetlands Inventory for 305(b) Report	The establishment of milestones and timelines for this period is dependent upon the results of the strategy and inventory reports described above.							
Surface Water Investigations	Purchased GOES Satellite equipment for conversion of 67 DEQ operated gaging stations; converted 11 GW wells to satellite transmission, and submitted SW-GW data to USGS for publication by April	Complete conversion of 67 stream gages to Satellite transmission and submit SW-GW Data to USGS for publication by April	Submit SW-GW Data to USGS for inclusion in Water Resources Data for Virginia publication by April and continued maintenance of network	Submit SW-GW Data to USGS for inclusion in Water Resources Data for Virginia publication by April and continued maintenance of network	Submit SW-GW Data to USGS for inclusion in Water Resources Data for Virginia publication by April and continued maintenance of network	Submit SW-GW Data to USGS for inclusion in Water Resources Data for Virginia publication by April and continued maintenance of network	Submit SW-GW Data to USGS for inclusion in Water Resources Data for Virginia publication by April and continued maintenance of network	Submit SW-GW Data to USGS for inclusion in Water Resources Data for Virginia publication by April and continued maintenance of network	Submit SW-GW Data to USGS for inclusion in Water Resources Data for Virginia publication by April and continued maintenance of network	Submit SW-GW Data to USGS for inclusion in Water Resources Data for Virginia publication by April and continued maintenance of network	Submit SW-GW Data to USGS for inclusion in Water Resources Data for Virginia publication by April and continued maintenance of network
Ground Water Monitoring Program		Design a comprehensive ground water monitoring program for the Commonwealth of Virginia, with estimates of the associated resource requirements?									
BEACH Monitoring Program (VDH)		Finalize interagency (DEQ/VDH) coordination & data transfer protocols for 305(b) assessment (by April)	BEACH monitoring data included in the 2006 305(b)/303(d) integrated report		BEACH monitoring data included in the 2008 305(b)/303(d) integrated report		BEACH monitoring data included in the 2010 305(b)/303(d) integrated report		BEACH monitoring data included in the 2012 305(b)/303(d) integrated report		BEACH monitoring data included in the 2014 305(b)/303(d) integrated report
Water Quality Standards Program											
Triennial WQS Review	Triennial Review completed			Triennial Review scheduled for completion			Triennial Review scheduled for completion			Triennial Review scheduled for completion	
Nutrient Standards Development		Estuarine criteria adopted and submitted for EPA approval	Reservoir & Lake criteria adopted and submitted for EPA approval	River & Stream criteria adopted and submitted for EPA approval							
Use Attainability Analysis		Continuous (as resources permit) and adopted as part of triennial reviews									

Table of TMDL Monitoring Objectives 2004 - 2014

Please note that the list of TMDLs presented here is based on impaired waters already identified in 2004. This list may increase significantly with the addition of waters assessed as impaired during the preparation of subsequent Integrated 305(b)/303(d) Reports. The numbers listed include impairments that may be due to natural causes and may not need a TMDL, but they were included in the listing because additional monitoring may be needed to confirm the natural impairment. This large number of TMDLs will be a significant monitoring challenge. The most significant challenges are listed below.

TOTAL Statewide TMDL Monitoring Data Needs – 2004-2014		
TMDL Parameter	**Number**	**Type of Monitoring Needed**
Fecal coliform	376	Field parameters, E. coli, fecal coliform
Benthic	142	Field parameters, benthic surveys, nutrients, diurnal DO, toxics, TSS (?), toxicity testing, sediment
Temperature	43	Field parameters, temperature, diurnal temperature
pH	76	Field parameters
DO	102	Field parameters, diurnal DO, nutrients, BOD5
Hg	3	Mercury, methylmercury, fish tissue, sediment
PCBs	25	PCBs, fish tissue, sediment, water (?)
TBT	3	
PAHs	1	
Cu	1	
Ammonia	1	
Nutrients	7	

MONITORING DATA NEEDS BY REGIONAL OFFICE

(Based on TMDLs due by 2014)

VRO		
TMDL Parameter	**Number**	**Type of Monitoring Needed**
Fecal coliform	61	Field parameters, E. coli, fecal coliform, BST
Benthic	38	Field parameters, benthic surveys, nutrients, diurnal DO, toxics, TSS, toxicity testing, sediment
Temperature	16	Field parameters, temperature, diurnal temperature
pH	13	Field parameters, alkalinity, hardness
DO	5	Field parameters, diurnal DO, nutrients
Hg	1	Field parameters, mercury, methylmercury, fish tissue, sediment
PCBs	1	PCBs, fish tissue, sediment, water (?)
PRO		
TMDL Parameter	**Number**	**Type of Monitoring Needed**
Fecal coliform	53	Field parameters, E. coli, fecal coliform, BST
Benthic	1	Field parameters, benthic surveys, nutrients, diurnal DO, toxics, TSS (?), toxicity testing, sediment
pH	31	Field parameters
DO	51	Field parameters, diurnal DO, nutrients, BOD5
Hg	1	Mercury, methylmercury, fish tissue, sediment
PCBs	1	PCBs, fish tissue, sediment, water (?)

NVRO

TMDL Parameter	Number	Type of Monitoring Needed
Fecal coliform	54	Field parameters, E. coli, fecal coliform, BST
Benthic	5	Field parameters, benthic surveys, nutrients, diurnal DO, toxics, TSS (?), toxicity testing, sediment
pH	16	Field parameters
DO	6	Field parameters, diurnal DO, nutrients, BOD5
Ammonia	1	
PCBs	4	PCBs, fish tissue, sediment, water (?)

SWRO

TMDL Parameter	Number	Type of Monitoring Needed
Fecal coliform	41	Field parameters, E. coli, fecal coliform, BST
Benthic	47	Field parameters, benthic surveys, nutrients, diurnal DO, toxics, TSS (?), toxicity testing, sediment
pH	2	Field parameters
DO	9	Field parameters, diurnal DO, nutrients, BOD5
Hg	1	Mercury, methylmercury, fish tissue, sediment
PCBs	9	PCBs, fish tissue, sediment, water (?)

SCRO

TMDL Parameter	Number	Type of Monitoring Needed
Fecal coliform	54	Field parameters, E. coli, fecal coliform, BST
Benthic	2	Field parameters, benthic surveys, nutrients, diurnal DO, toxics, TSS (?), toxicity testing, sediment
pH	1	Field parameters, alkalinity, hardness
DO	3	Field parameters, diurnal DO, nutrients, BOD5
PCBs	3	PCBs, fish tissue, sediment, water (?)

TRO

TMDL Parameter	Number	Type of Monitoring Needed
Fecal coliform	43	Field parameters, E. coli, fecal coliform, BST
Benthic	13	Field parameters, benthic surveys, nutrients, diurnal DO, toxics, TSS (?), toxicity testing, sediment
pH	7	Field parameters
DO	22	Field parameters, diurnal DO, nutrients, BOD5
Nutrients	7	
TBT	3	
PCBs	6	PCBs, fish tissue, sediment, water (?)
PAHs	1	
Cu	1	

WCRO

TMDL Parameter	Number	Type of Monitoring Needed
Fecal coliform	70	Field parameters, E. coli, fecal coliform, BST
Benthic	36	Field parameters, benthic surveys, nutrients, diurnal DO, toxics, TSS, toxicity testing, sediment
Temperature (natural)	27	Field parameters, temperature, diurnal temperature
pH (natural)	6	Field parameters, alkalinity, hardness
DO (natural)	6	Field parameters, diurnal DO, nutrients
PCBs	1	Field parameters, PCBs, fish tissue, sediment

Section VII.

Citizen Monitoring Guidance for DEQ Staff

Summary:

This memo provides guidance for responding to citizen requests for agency monitoring in accordance with the 1997 *Water Quality Monitoring, Information and Restoration Act*, agency support for citizen monitoring according to the Code of Virginia §62.1-44.19:11, and conducting follow-up monitoring of waters of concern as identified in the 305(b) water quality assessment.

Contact information for this Section:

For more information, please contact Joyce Brooks, at (804) 698-4026, or email: mailto:jfbrooks@deq.state.va.us

Guidance on Citizen Monitoring

For the purposes of this guidance document, a citizen water quality monitoring program, or citizen monitoring, is defined as water quality monitoring which uses volunteers to collect the data. Some of these programs are run by local governments, soil and water conservation districts, citizen organizations, community organizations, or colleges. Generally, K-12 school monitoring is conducted for educational purposes and does not fall under "citizen monitoring" unless working in cooperation with existing citizen monitoring efforts. "Citizen monitoring" is not defined as monitoring conducted by all entities external to DEQ, such as colleges and local governments, unless volunteers are used in their efforts.

Section 7.1 Citizen Nominations for Water Quality Monitoring

The 1997 *Water Quality Monitoring, Information and Restoration Act* (WQMIRA) directs the Board to provide a procedure for citizens to nominate portions of lakes, streams, and rivers of Virginia for water quality monitoring by DEQ (§62.1-44.19:5.F). The Citizen Monitoring Coordinator (CMC) will distribute the nomination guidance and nomination form to interested parties by October 1st of each calendar year. Each request must be submitted to the CMC between October 1st and December 31st of each calendar year using the nomination form. See the most current version of the nomination guidance for detailed procedures for citizens to follow when requesting monitoring pursuant to WQMIRA (105kb file).

(http://www.deq.state.va.us/watermonitoring/pdf/guidancemanual/cmonnom.pdf)

The CMC will provide the nominations to the monitoring managers of the appropriate regional and central offices by January 15th of each calendar year, requesting a written response from the monitoring managers by March 1st. The regional office or central office unit should approve or deny each request using the most current version of the review form. Upon consideration of the requests, staff is asked to complete a checklist on the review form so that the elements considered by each region or central office unit are consistent. Overall, the checklist guides staff to consider whether nominated stream segments

are in an area of high recreational use, can be incorporated into the current or upcoming watershed rotation or are scheduled for future monitoring, whether these segments are a "Water of Concern", in an area of another environmental concern, or a priority according to the monitoring strategy (73kb file).

(http://www.deq.state.va.us/watermonitoring/pdf/guidancemanual/cmonnmck.pdf)

The CMC will respond in writing to each request by April 30th of each calendar year in accordance with the statute. Each response will indicate DEQ's approval or denial of the request and state the reasons for denial.

Section 7.2 DEQ Support for Citizen Monitoring

Technical guidance is provided to citizen monitoring organizations according to the Code of Virginia §62.1-44.19:11 through the Citizen Monitoring Coordinator (CMC) and occasionally assistance specific to a region is requested from regional office staff by the citizen monitoring organization or the CMC. This technical assistance is mainly related to selecting sites that will not duplicate DEQ monitoring efforts, choosing appropriate protocols and parameters (especially those that will produce data that can be used by DEQ for water quality assessments), and developing a Quality Assurance Project Plan. The most recent version of the *Virginia Citizen Water Quality Monitoring Program Methods Manual* is a primary source of technical assistance for citizen monitoring organizations. The manual discusses in detail the development of a monitoring program and Quality Assurance Project Plans (QAPPs), along with discussing the various parameters commonly monitored by volunteer monitoring programs in Virginia (1,915kb file).

(http://www.deq.state.va.us/watermonitoring/pdf/guidancemanual/cmonman.pdf)

Chemical citizen monitoring QAPPs are reviewed and approved in accordance with current agency guidelines and Section 3.0 below. Guidelines for the review of macroinvertebrate citizen monitoring QAPPs will be developed by December 31, 2004. Once guidelines are established, DEQ will review and approve macroinvertebrate citizen monitoring QAPPs. The citizen monitoring organization should submit plans to the CMC in accordance with the format provided in the *EPA Volunteer Monitor's Guide to Quality Assurance Project Plans.* The CMC provides assistance to organizations in the development of QAPPs.

In addition to technical assistance, the Citizen Water Quality Monitoring Grant Program provides competitive grants, as state resources allow, to support citizen monitoring programs. This grant program is referenced in the most recent version of the *Virginia Citizen Water Quality Monitoring Program Methods Manual.* The Request for Proposals for the grant program contains the specific grant requirements.

The Code of Virginia §62.1-44.19:11 states that grant funds may be provided to organizations that are conducting water quality monitoring under a Memorandum of Agreement (MOA) with DEQ. Currently, the grant contracts signed by DEQ and the grantees meet the requirements of §62.1-44.19:11. A boilerplate MOA (see the most recent version of the *Virginia Citizen Water Quality Monitoring Program Methods Manual)* has been developed for citizen monitoring organizations desiring a more comprehensive MOA with DEQ.

Section 7.4 Submittal of Data to Assessment Staff

The Citizen Monitoring Coordinator will solicit data from citizen monitoring organizations. The CMC and DEQ's Quality Assurance Officer and biological program coordinators will review all QAPPs, including standard operating procedures (SOPs), training manuals, and current monitoring procedures for each of the active citizen monitoring groups. Based upon the review of all procedures, the appropriate use of the data for each parameter will be determined. Since there are varying levels of data use, DEQ approval is in the form of a letter that approves data for each parameter for use in the 305(b) water quality assessment and specifies the appropriate data use for each parameter.

All QA/QC documentation and citizen monitoring data collected during an assessment window must be provided to the CMC by December 31st of the last year of that assessment window. The CMC will submit by April 1st (or according to the assessment schedule) each organization's data set to the appropriate regional office assessment staff along with a summary table and cover memo detailing QA/QC approval. If regional office staff receive citizen data from an individual group, the regional office should forward that data for review as outlined above. Data will be used by DEQ as outlined in the assessment guidance.

Please refer to the most recent §305(b) Water Quality Assessment Guidance document for detailed information concerning how to process citizen data and coordinate the final assessment with the CMC. The §305(b) Water Quality Assessment Guidance document is submitted to the public for review via the *Virginia Register* in late summer prior to the report being due in April of even-numbered years.

Section 7.4 DEQ Response to Problems Detected by Citizen Monitoring Organizations

Since citizen monitoring organizations generally monitor on a regular basis, a volunteer monitor may detect acute pollution incidents, degradation, or potential problems. Often, the citizen monitoring organization may not know which agency is responsible or what is causing the problem but believes that their observations warrant further investigation. The organization or individual monitor may report the problem to the Citizen Monitoring Coordinator or directly to the regional DEQ office.
These reports should be handled as follows:

1. If the problem is not under the purview of DEQ (for example, erosion and sediment control issues should be referred to local government staff), the organization should be directed to the appropriate agency.

2. If the problem is immediate and acute, it should be immediately referred to the Pollution Response Program (PREP). Examples of acute problems include a fish kill, oil spill, or red tide.

3. If the problem is under DEQ's purview and not acute in nature (such as large sudden fluctuations in monitoring data results), the regional office shall determine the most appropriate way to respond to this and notify the complainant and the CMC within 30 days whether action will be taken. The regional office shall notify the complainant and the CMC the results of any action taken within 30 days of completion of such action(s).

The regional office should document complaints and responses. Any complaints received by the Citizen Monitoring Coordinator will immediately be forwarded as outlined above, or forwarded to the appropriate regional office monitoring supervisor for follow-up.

Section 7.4.1 DEQ Follow-Up Monitoring of Waters of Concern

In accordance with the agency 305(b) water quality assessment guidance and Section 3.0 above, citizen monitoring data collected under DEQ-approved Quality Assurance Project Plans (this approval is parameter-specific for a specific level of data use) will be included in the 305(b) assessment. Water column chemical data and biological monitoring data collected by citizen monitoring organizations and incorporated into the assessment process may result in a stream segment being identified as a Water of Concern. Waters of Concern are not necessarily predicted to exceed water quality standards or be listed as impaired in the next reporting period. Rather, they are highlighted as potential problem areas.

The agency will use both chemical and biological citizen monitoring data to prioritize stream segments for follow-up monitoring. It is the intention of the agency, as resources allow, to conduct follow-up monitoring in stream segments identified as waters of concern, with high priority stream segments being addressed first, followed by lower priority stream segments that do not meet the criteria specified below.

Follow-up monitoring should be conducted on high priority stream segments within three years of the final submittal date of the 305(b) water quality assessment that identifies a stream segment as a water of concern. Regional assessment staff will be responsible for coordinating with regional monitoring staff to identify those Waters of Concern that are considered high priority for follow-up monitoring. Regional offices will schedule follow-up monitoring as confirmatory visits or part of the annual monitoring plan development and notify the CMC. The CMC will notify the organization of the plan for DEQ follow-up monitoring so that monitoring efforts will not be duplicated. Regional offices may use additional discretion in prioritizing the high priority stream segments for follow-up monitoring based on available resources and knowledge of the stream segment(s) in question. This may include consultation with the citizen monitoring group(s) that conducted the monitoring identifying the Waters of Concern.

High priority stream segments resulting from citizen water column chemical data are defined by the exceedance rate of a given parameter and a minimum sample size. The following criteria shall be used to identify high priority stream segments:

1. There must be a minimum number of four samples for the parameter(s) of concern.
2. The sampling events must extend over at least a three-month period but must have occurred within the most recent two years of the 305(b) assessment window. The sampling events are not required to be evenly distributed over the three-month period, but should reflect stream conditions over the three-month term.
3. The exceedance rate of the water quality criteria and/or screening value must be greater than 25% during the 305(b) assessment period.

DEQ will conduct follow-up monitoring to citizen biological surveys that result in a stream segment being classified as a Water of Concern in the following manner. High priority stream segments shall be defined by the following criteria:

1. There must be a minimum of four sampling events conducted over at least a one-year period during the 305(b) assessment window. These events must have occurred within the most recent two years of the 305(b) assessment window.
2. The monitoring data must capture seasonal variation and shall include at least one spring and one fall sampling event during the 305(b) assessment period.

3. The citizen monitoring results must consistently indicate that the stream segment exhibits poor stream health, and the 305(b) assessment must rate the segment as having a high probability of adverse conditions for biota

At a minimum, DEQ will conduct follow-up monitoring for the same parameter(s) which resulted in the stream segment being identified as a water of concern by the citizen organization. Staff may elect to monitor for an expanded set of parameters based upon concerns raised by the citizen data, knowledge of the stream segment, or other factors that relate to the threatened beneficial use.